Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-13. (cancelled).

14. (previously presented) A method for selecting a compound which reduces an activity of a SCN3A sodium channel comprising:

(a) contacting a composition comprising a SCN3A sodium ion channel protein with a test compound;

(b) assaying the activity of the sodium ion channel in the presence of the test compound;

(c) comparing the activity of the sodium ion channel in the absence of said test compound;

(d) selecting a compound which reduces the activity of the sodium ion channel as compared to the activity of the sodium ion channel in the absence of the test compound;

wherein said SCN3A protein is selected from the group consisting of

(i) an amino acid sequence set forth in SEQ ID NO:67; and

(ii) a SCN3A protein expressed by a SCN3A nucleic acid sequence having at least 95% identity to the nucleic acid sequence as set forth in SEQ ID NO:65.

Claims 15-33 (cancelled).

34. (previously presented) The method of claim 14, wherein the method is used for selecting a compound capable of reducing voltage-gated ion channel activity of a human SCN3A protein associated with idiopathic generalized epilepsy (IGE).

35. (previously presented) The method of claim 14, wherein the method is used for selecting a compound capable of reducing voltage-gated ion channel activity of a human SCN3A protein associated with generalized epilepsy with febrile seizures.

36. (previously presented) The method of claim 14, wherein the test compound is a library of test compounds.

37. (previously presented) The method of claim 14, wherein a SCN3A nucleic acid encoding the SCN3A protein is comprised in an expression vector.

38. (previously presented) The method of claim 37, wherein the expression vector is comprised in a cell.

39. (previously presented) The method of claim 14, wherein the assaying is performed with a whole cell.

40. (previously presented) The method of claim 14, wherein the ion channel activity is:

(i) voltage dependence activation;

(ii) voltage dependence of steady state level of inactivation;

(iii) time course of inactivation;

(iv) the number or fraction of channels available for opening;

(v) change in current;

(vi) flux of ions through the channel;

(vii) phosphorylation of channel;

(viii) binding of molecules to the channel; or

(ix) induction of a second cellular messenger.

41. (previously presented) The method of claim 40, wherein the flux of ions through the channel is assessed by:

(i) fluorescence resonance energy transfer (FRET)-based voltage sensor assay;

(ii) dibasic dyes;

(iii) ^{14}C-guanidine;

(iv) two electrode voltage clamp; or

(v) patch-clamp.

42. (previously presented) The method of claim 40, wherein the binding of molecules through the channel is assessed by surface plasmon resonance.

43. (previously presented) The method of claim 14, wherein the method is used for selecting a compound which reduces the hyperexcitability state of a SCN3A ion channel.

44. (previously presented) The method of claim 14, wherein SEQ ID NO. 67 is encoded by a nucleic acid.

45. (previously presented) The method of claim 14, wherein a SCN3A nucleic acid sequence comprises a sequence selected from the group consisting of SEQ ID NOs: 400-408.

46. (previously presented) The method of claim 45, wherein a SCN3A protein comprises a Val1035Ile mutation.

47. (previously presented) The method of claim 45, wherein a SCN3A protein comprises a Asn43DEL mutation.